

Exelon Generation
4300 Winfield Road
Warrenville, IL 60555

www.exeloncorp.com

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U. S. Nuclear Regulatory Commission
ATTN: Document Control Desk
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Quad Cities Nuclear Power Station, Units 1 and 2
Facility Operating License Nos. DPR-29 and DPR-30
NRC Docket Nos. 50-254 and 50-265

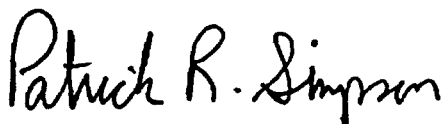
Subject: Supplemental Information For Analysis of Transmission Lines in Quad Cities Nuclear Power Station License Renewal Application

Reference: Letter from J. A. Benjamin (Exelon Generation Company) to U. S. NRC, "Application for Renewed Operating Licenses," dated January 3, 2003

Exelon Generation Company, LLC (EGC) is submitting supplemental information concerning the length of transmission lines that were analyzed in the License Renewal Environmental Report for Quad Cities Nuclear Power Station, which was previously submitted as part of the Application for Renewed Operating Licenses for Dresden Nuclear Power Station (DNPS) and Quad Cities Nuclear Power Station (QCNPS) in the referenced letter. During a March 12, 2003, NRC site audit at QCNPS, the NRC requested EGC provide the reasoning underlying the transmission line analysis contained in the referenced letter. The Attachment to this letter provides the reasoning that EGC used to determine the length of transmission lines that would have to be analyzed for the purpose of license renewal.

Should you have any questions, please contact Al Fulvio at 610-765-5936.

Respectfully,



Patrick R. Simpson
Manager – Licensing
Mid-West Regional Operating Group

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Attachments:

Affidavit

Attachment: Supplemental Information For Analysis of Transmission Lines in Quad Cities
Nuclear Power Station License Renewal Application


cc: Regional Administrator – NRC Region III
NRC Senior Resident Inspector – Quad Cities Nuclear Power Station
Office of Nuclear Facility Safety – Illinois Department of Nuclear Safety

STATE OF ILLINOIS)
COUNTY OF DUPAGE)
IN THE MATTER OF)
EXELON GENERATION COMPANY, LLC) Docket Numbers
Quad Cities Nuclear Power Station - Units 1 and 2) 50-254 and 50-265

SUBJECT: Supplemental Information For Analysis of Transmission Lines in
Quad Cities Nuclear Power Station License Renewal Application

AFFIDAVIT

I affirm that the content of this transmittal is true and correct to the best of
my knowledge, information, and belief.


Patrick R. Simpson
Manager - Licensing
Mid-West Regional Operating Group

Subscribed and sworn to before me, a Notary Public in and

for the State above named, this 14th day of

May, 2003


Notary Public



Attachment

**Supplemental Information For Analysis of Transmission Lines
in Quad Cities Nuclear Power Station License Renewal Application**

**Supplemental Information for Analysis of
Transmission Lines in Quad Cities Nuclear Power Station
License Renewal Application**

ISSUE

Whether required reviews of the application for renewal of the Quad Cities Nuclear Power Station (QCNPS) reactor operating licenses can be completed without analyzing impacts of operating a segment of a transmission line that was reviewed at the time of the original plant licensing.

SUMMARY AND CONCLUSIONS

Exelon Generation Company (EGC), LLC operates QCNPS pursuant to NRC licenses. In determining the scope of the transmission lines to include in the environmental report (ER) prepared in connection with the QCNPS license renewal application EGC applied a "causal relationship" test under the National Environmental Policy Act (NEPA). If impacts from transmission line operation are caused by station operation, then there is a causal relationship between station operation and the impacts, and environmental impacts from the operation of transmission lines are within the scope of NEPA (as a corollary, EGC found that if line impacts would continue regardless of station operation, then there is no causal relationship between station operation and the impacts and a NEPA review would not include the line.) Certain Nuclear Regulatory Commission (NRC) Staff guidance given during review of the Oconee license renewal is inconsistent with the "causal relationship" test. However, guidance recently given to EGC in connection with the Peach Bottom license renewal application is consistent with the "causal relationship" test.

Excluding from the QCNPS license renewal ER a segment of a transmission line that was reviewed as part of the original QCNPS licensing proceeding is consistent with the "causal relationship" test and the NRC guidance provided to EGC with respect to Peach Bottom. Accordingly, the segment of the Nelson South Line between the Cordova Energy Center and the Nelson Substation would be outside the scope of NEPA and thus would not be addressed in the ER. Similarly, the segment of the Nelson North line between Northwestern Steel and Wire Company and the Nelson Substation, the segment of the Barstow Line between the Cordova Energy Center and the Barstow substation, and the segment of the Davenport Line from Substation 91 to Substation 56 would not be addressed in the ER. The rationale is equally applicable for reviews pursuant to the Endangered Species Act and the National Historic Preservation Act.

BACKGROUND – TRANSMISSION LINE STATUS AT THE TIME OF ORIGINAL LICENSING AND THE LICENSE RENEWAL APPLICATION

A. Original Licensing

Commonwealth Edison Company and the Iowa-Illinois Gas and Electric Company built QCNPS in Rock Island County, Illinois, on the east bank of the Mississippi River. The final environmental statement (“FES”) for QCNPS operation identifies four 345-kilovolt transmission lines as originating at QCNPS.¹ The lines were the following:

Nelson North (Line 0404) – The FES identified this line as owned by Commonwealth Edison Company, terminating at Nelson Substation, and as the 39.7-mile-long north line.

Nelson South (Line 0403) – The FES identified this line as owned by Commonwealth Edison Company, terminating at Nelson Substation, and as the 41.9-mile-long south line.

Barstow (Line 0402) – The FES identified this line as owned by the Iowa-Illinois Gas and Electric Company and traveling 17.5 miles to the company’s Substation 39. This substation is also known as the Barstow Substation.

Davenport Line (Line 0401) – The FES identified this line as owned by the Iowa-Illinois Gas and Electric Company and traveling 27 miles to the company’s Substation 56. This substation is also known as the Davenport Substation.

The FES notes that the Iowa-Illinois Gas and Electric Company lines (i.e., Barstow and Davenport) were planned and would have been built regardless of whether QCNPS was built.

B. Developments Since Original Licensing

Since FES publication, there have been several physical and ownership changes to the QCNPS transmission line station. First, Alliant Energy Corporation constructed a fifth transmission line at QCNPS, as described below:

Rock Creek (Line 0405) – This line runs approximately 5 miles from QCNPS, across the Mississippi River, to the Rock Creek Substation in Iowa.

Second, Northwestern Steel and Wire Company constructed a major manufacturing facility at Sterling, Illinois, approximately 5 miles from the Nelson Substation. The QCNPS Nelson North Line (Line 0404) has been routed into a substation at the facility and then to the Nelson Substation. Regardless of QCNPS operation, the manufacturing facility obtains its electricity from these lines, through the QCNPS switchyard or the Nelson substation.

Third, a new Substation 91 has been constructed outside of Davenport, Iowa. The Davenport Line (Line 0401) has been routed into Substation 91 before continuing on to Substation 56. Substation 91 connects to smaller (161 kilovolt) lines of the Davenport electric distribution

system. Regardless of QCNPS operation, Substation 91 functions as part of the Davenport regional electrical grid by being energized through the QCNPS switchyard, Substation 56, or other substations.

Fourth, Illinois has undertaken partial deregulation of its electric utilities and, as a result, corporate entities have evolved. Commonwealth Edison Company ownership interest in QCNPS is now held by Exelon Corporation. EGC, an Exelon Corporation subsidiary, holds the NRC licenses to own and operate QCNPS. Commonwealth Edison Company ownership of QCNPS transmission lines is now held by Commonwealth Edison, another Exelon Corporation subsidiary. EGC, as holder of generating assets, is deregulated, and Commonwealth Edison, as holder of transmission assets, is regulated. Iowa-Illinois Gas and Electric Company ownership in QCNPS and in QCNPS transmission lines is now held by MidAmerican Energy Company. MidAmerican Energy and Exelon (and Alliant, mentioned above) are independent corporate entities.

Finally, MidAmerican Energy completed in June 2001 construction of a 500-megawatt gas-fired electric generating plant, the Cordova Energy Center, located 2 miles east of QCNPS adjacent to the Barstow and Nelson South transmission lines. Construction included a switchyard connected to a substation. At that time, the Barstow line was re-routed into and out of the Cordova switchyard and the Nelson South line was re-routed into and out of a new ring-bus-type substation built specifically for the inclusion of the Cordova Energy Center. This configuration gives Cordova access to the regional electrical grid independent of QCNPS operation.

C. The QCNPS ER

In preparing the ER for QCNPS license renewal, EGC determined which transmission lines to include within the scope of license renewal. Table 1 summarizes the differences between the QCNPS FES and the QCNPS license renewal ER coverage.

In connection with EGC's application to NRC to renew the QCNPS licenses, the NRC Staff requested, during a site audit at QCNPS on March 12, 2003, that EGC provide the reasoning for "shortening" the transmission line analysis as summarized above. In making this determination, EGC relied primarily upon the "causal relationship" test, described further below.

DISCUSSION

A. The NEPA "Causal Relationship" Test

10 C.F.R. Part 51, Subpart A establishes NRC requirements for implementing NEPA Section 102(2).² Section 102(2) requires federal agencies to evaluate the impacts that their actions have on the environment and, for major federal actions, to prepare detailed statements on environmental impacts.³ The NRC has determined that license renewal is a major federal action necessitating preparation of an environmental impact statement (EIS).⁴ Subpart A specifies the

Table 1. Comparison of QCNPS Transmission Line Coverage

Line	FES	License Renewal Environmental Report
Nelson North	Included in entirety from QCNPS to Nelson Substation	Included from QCNPS to Northwestern Steel and Wire Company Excluded from Northwestern Steel and Wire Company to Nelson Substation
Nelson South	Included in entirety from QCNPS to Nelson Substation	Included from QCNPS to Cordova Energy Center Excluded from Cordova Energy Center to Nelson Substation
Barstow	Included in entirety from QCNPS to Barstow Substation*	Included from QCNPS to Cordova Energy Center Excluded from Cordova Energy Center to Barstow Substation
Davenport	Included in entirety from QCNPS to Davenport Substation 56*	Included from QCNPS to Davenport Substation 91 Excluded from Substation 91 to Davenport Substation 56
Rock Creek	Excluded (line built after FES published)	Included in entirety from QCNPS to Rock Creek Substation

*Line identified but noted as would have been constructed regardless of QCNPS.

contents of a license renewal EIS⁵ and acknowledges the NRC's policy of voluntarily taking into account regulations of the Council on Environmental Quality (CEQ).⁶ Thus, in the instant situation, the NRC should look to the pertinent CEQ regulations as guidance in dispositioning the transmission line issue.⁷ NRC regulations do not indicate an intent to exceed NEPA requirements or CEQ guidance.

CEQ regulations provide, among other things, that to determine the scope of an EIS, an agency shall consider three types of impacts: direct, indirect, and cumulative.⁸ CEQ goes on to define "effects" (which are synonymous with "impacts")⁹ as (1) direct effects, which are caused by the action and occur at the same time and place; and (2) indirect effects, which are caused by the action and are later in time or farther removed in distance, but are still reasonably foreseeable.¹⁰ From these definitions can be drawn an important "test:" *for an environmental effect to be within the scope of an EIS, the effects must be caused by the action.* Put another way, there must be a

causal relationship between the federal action and the effect. The federal action must cause the change in the physical environment; if the change, or effect, would occur regardless of the federal action, there is no causal relationship within the scope of NEPA.

B. NRC Regulations and Guidance Pertaining to Transmission Lines in License Renewal

NRC license renewal regulations specifically address transmission lines one time: this regulation pertains to the consideration of shock hazard, which is a Category 2 issue.¹¹ Accordingly, the applicant must make the following analysis:

If the applicant's transmission lines that were constructed for the specific purpose of connecting the plant to the transmission system do not meet the recommendations of the National Electric Safety Code for preventing electric shock from induced currents, an assessment of the impact of the proposed action on the potential shock hazard from the transmission lines must be provided.

The NRC Staff provided limited guidance on the scope of transmission lines to be considered in a license renewal applicant's ER with respect to the Oconee station in 1999.

Oconee

In preparing its license renewal application for Oconee, Duke Energy Corporation (Duke) excluded from its ER transmission lines that had been included in the FES for the original operating licenses. In response to an NRC request for additional information about these lines, Duke indicated that the lines in question were excluded because they would remain in use even if the Oconee station shut down.¹² The NRC response to Duke indicated that "[s]ince the basis for determining the scope of transmission lines is defined as those lines originally constructed for the specific purpose of connecting the plant to the transmission system, the argument that the transmission lines will remain energized irrespective of Oconee operation is irrelevant."¹³ The Staff also determined that the scope of review of transmission lines for the Category 2 issue concerning threatened or endangered species should be identical to the scope of review for electric shock -- the set of transmission lines that were constructed for the specific purpose of connecting the plant to the transmission system.¹⁴ The need to include the transmission lines was again challenged by a commenter on the draft EIS but the Staff's position remained unchanged.¹⁵

It appears from the Oconee correspondence that the NRC Staff did not consider the issue from a NEPA "causal relationship" standpoint. That is, it is not clear whether the agency viewed the transmission lines in question as part of the proposed action, or as having impacts that would be directly or indirectly caused by, or cumulative with, Oconee license renewal. The basis for the NRC Staff's determination appeared to have been simply that the line was covered by the original NRC licensing action (*i.e.*, by the FES for operation).

Peach Bottom

In a slightly different context, the NRC Staff recently considered the scope of transmission lines in connection with the National Historic Preservation Act (NHPA) analysis performed in connection with license renewal.¹⁶ During the review of the Peach Bottom Atomic Power Station application for license renewal, a state historic preservation officer (SHPO) raised questions about potential impacts from a transmission line that connects Peach Bottom to the Keeney Substation. The FES for Peach Bottom included the Keeney Line.¹⁷ However, the NRC Staff determined that the portion of the transmission corridor about which the SHPO was concerned fell outside the Area of Potential Effects (APE) for the proposed renewal of the Peach Bottom operating licenses.¹⁸ On a more generic basis, the Staff determined in that communication that "the APE for a license renewal action is the area at the power plant site and its immediate environs which may be impacted by post-license renewal land disturbing operation or projected refurbishment activities associated with the proposed action." Therefore, the NRC excluded the Delaware portion of the Peach Bottom-to-Keeney transmission corridor from the APE for the proposed license renewal.

Analysis

To paraphrase the NRC regulation, a license renewal applicant must identify transmission lines that were constructed for the specific purpose of connecting the plant to the transmission system and assess the impact of license renewal on the potential shock hazard from those lines. If the lines meet recommendation of the National Electrical Safety Code for preventing electric shock from induced currents, NRC has concluded that the impact is small.¹⁹

EGC has identified QCNPS transmission lines that were constructed for the specific purpose of connecting the plant to the transmission system and has performed its assessment. EGC found that segments of the lines fall into two categories. For segments in the first category, license renewal could have an impact because there is or could be a causal relationship between license renewal and shock hazard. The QCNPS license renewal ER included segments in this category, together with an analysis of shock hazard. For segments in the second category, license renewal would have no impact because there is no causal relationship between license renewal and any shock hazard that might exist. EGC excluded these segments from the QCNPS ER. The following paragraphs discuss this assessment in more detail.

License renewal and issuance of the original operating license are separate federal actions, and the action before the agency at the time of original licensing is different than the action before NRC today. The plant and transmission lines have undergone modifications, regulatory requirements have changed, and operations are different. Effects caused by operation in 1972 would not, *a priori*, be the same as those caused by operation today or during the term of license renewal. The Nelson South line is an excellent example of this fact.

At the time of QCNPS construction, the Nelson South transmission line was clearly constructed to connect the station to the regional electrical system. Nelson South transmission line effects, therefore, had a causal relationship to QCNPS and FES inclusion of the line from QCNPS to the

Nelson Substation the FES was appropriate. If QCNPS had not been built, then the line would not have been built.

The situation today, however, is different. Construction of the Cordova Energy Center, and the need to connect the Center to the regional electrical system, have created another reason for the existence of the Nelson South transmission line between the Center and the Nelson Substation. If NRC denied QCNPS license renewal, and EGC shut down the nuclear plant, then the line from the Cordova Energy Center would still be used to connect the Cordova Energy Center to the regional system. Because the effects of the transmission line would continue, regardless of QCNPS renewal, there is no causal relationship between the NRC federal action, license renewal, and any Nelson South transmission line effects between the Cordova Energy Center and the Nelson Substation. For this reason, the QCNPS ER excludes the Nelson South transmission line between the Cordova Energy Center and the Nelson Substation

EGC's analysis of the Nelson South line is consistent with the position that NRC took in the Peach Bottom case. In that case, NRC indicated that the Delaware portion of the Keeney line was outside of the license renewal APE. There, the NRC could conclude that there would be no causal relationship between Peach Bottom license renewal and any Keeney line effects. Similarly, there would be no causal relationship between QCNPS license renewal and Nelson South line effects between the Cordova Energy Center and the Nelson Substation.

The causal relationship test also justifies EGC's exclusion of other portions of the QCNPS transmission lines. NRC denial of QCNPS licenses renewal would not mean that the Northwestern Steel and Wire Company facility would stop using electricity. At a minimum, the facility would need its connection to the Nelson Substation to obtain electricity from the regional system. For this reason, EGC excluded from QCNPS license renewal scope the portion of the Nelson North line between Northwestern Steel and Wire Company facility and the Nelson Substation.

The FES indicates that the Barstow and Davenport lines "were planned and would have been built to an alternative source of power in the area had the station [i.e., QCNPS] not been built..." This provides some support for using the causal relationship test. However, the FES goes on to discuss topography crossed by the Davenport line, so it was unclear to EGC whether the agency viewed these lines as in- or out-of-scope. EGC believes that these lines would remain in use regardless of QCNPS license renewal but has not developed a technical basis for this belief. For the purposes of its license renewal application, therefore, EGC concluded that, absent other factors, these lines would be evaluated for license renewal. However, as in the case of the Nelson South line, the Cordova Energy Center provides a justification for much of the Barstow line that is independent of QCNPS license renewal. For this reason, EGC excluded from QCNPS license renewal scope the Barstow line between the Cordova Energy Center and the Barstow Substation. Similarly, the Davenport line between Substations 91 and 56 have independent bases and were excluded.

The causal relationship test also applies to lines constructed after the FES was published. The Rock Creek line was constructed to connect QCNPS to the regional electrical system. At this

time, EGC does not have a basis for demonstrating that the line would remain in use regardless of QCNPS license renewal. For the purposes of its license renewal application, EGC concluded that, notwithstanding the line's absence from the FES, there is a causal relationship between line effects and QCNPS operation and license renewal. Therefore, EGC included the Rock Creek line.

As discussed above, EGC had determined that the proposed action, license renewal, would have no effect on certain portions of QCNPS transmission lines. Therefore, excluding those portions is consistent with the NRC regulation; there are no potential effects for those portions of the lines.

Finally, EGC reviewed Endangered Species Act and National Historic Preservation Act requirements as they would apply to QCNPS transmission lines. However, EGC could identify no basis for concluding that their scope was different than the NEPA scope already evaluated. In fact, the NRC Oconee guidance indicated that the scope of review for threatened or endangered species should be identical to the scope of review for electric shock. NRC, in undertaking QCNPS license renewal, would be taking no action with regard to QCNPS transmission lines and there is no causal relationship between NRC action and effects from the excluded segments of the transmission lines. Therefore, the NRC review scope under the Endangered Species Act and the National Historic Preservation Act should be the same as that under NEPA.

CONCLUSION

Reviews required under NEPA, the Endangered Species Act, and the National Historic Preservation Act do not necessitate review of the QCNPS Nelson South Line between the Cordova Energy Center and the Nelson Substation. The same rationale, based on the NEPA "causal relationship" test, justifies excluding segments of the Nelson North, Barstow, and Davenport lines while necessitating inclusion of the recently constructed Rock Creek line.

¹ *Final Environmental Statement Related to Operation of Quad Cities Nuclear Power Station Units 1 & 2*, United States Atomic Energy Commission, Washington, D.C., Docket Nos. 50-254 and 50-265, September 1972, Section III-B, beginning at page III-1.

² 10 C.F.R. 51.1.

³ 42 U.S.C.4332.

⁴ 10 C.F.R. 51.95(c).

⁵ 10 C.F.R. 51.70, 51.71, 51.95.

⁶ 10 C.F.R. 51.10(a).

7 *See* 10 C.F.R. 51.29(a)(1).

8 40 C.F.R. 1508.25(c).

9 40 C.F.R. 1508.8.

10 40 C.F.R. 1508.8.

11 10 C.F.R. 51.53(c)(3)(ii)(H).

12 Letter, Tuckman, Duke Energy Corporation, to NRC Document Control Desk, 3/4/99.

13 Letter, Carpenter, NRC, to McCollum, Duke Energy Corporation, 5/10/99.

14 *Id.* The Endangered Species Act ("ESA") requires Federal agencies to ensure that agency action is not likely to jeopardize any species that is listed or proposed for listing as endangered or threatened. *See* 16 U.S.C. 1531 *et seq.* The U.S. Fish and Wildlife Service has issued procedural regulations (*see* 50 C.F.R. Part 402) that define "action" to include permitting and "effects of the action" using language that is almost identical to CEQ NEPA language. *See* 50 C.F.R. 402.02. NRC license renewal regulations require that ". . . [a]dditionally, the applicant shall assess the impact of the proposed action on threatened or endangered species in accordance with the [ESA]." 10 C.F.R. 51.53(c)(3)(ii)(E). The rationale set forth above with respect to consideration of transmission lines under NEPA is equally applicable to the question of ESA compliance. If a transmission line would remain in operation regardless of license renewal, the agency action with regard to license renewal has no causal relationship to any line effects and the line is outside the scope of the ESA.

15 Generic Environmental Impact Statement for License Renewal of Nuclear Plants; Supplement 2; Regarding the Oconee Nuclear Stations, U.S. Nuclear Regulatory Commission, NUREG-1437, Supp. 2, December 1999, at Section A.1.7.

16 The NHPA requires federal agencies having authority to license any undertaking to take into account the effect of the proposal on historic properties and to afford the Advisory Council on Historic Preservation ("Council") an opportunity to comment, if necessary. *See* 16 U.S.C. 470 *et seq.* Committee regulations provide for establishing an agreement with any State Historic Preservation Officer to substitute state review for Council review (*see* 35 C.F.R. 800.7) and define "undertaking" to include licensing. *See* 35 C.F.R. 800.16(y). NRC regulations require that "[a]ll applicants shall assess whether any historic or archaeological properties will be affected by the proposed project." 10 C.F.R. 51.53(c)(3)(ii)(K). The QCNPS license renewal scope for the NHPA should be the same as that for NEPA and the ESA, as discussed above.

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- ¹⁷ *Final Environmental Statement Related to Operation of Peach Bottom Atomic Power Station Units 2 and 3*, United States Atomic Energy Commission, April 1973, Section III-B, beginning at page III-6.
- ¹⁸ Letter, Wheeler, NRC, to Griffith, Delaware State Historic Preservation Officer, 1/9/03.
- ¹⁹ Generic Environmental Impact Statement for License Renewal of Nuclear Plants, U.S. Nuclear Regulatory Commission, NUREG-1437, May 1996, Section 4.5.4.1 at page 4-67.